Gallium Arsenide Based 1-Micrometer Integrated Analog Transmitter

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The official link for this solicitation is:
http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20152/index.shtml

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Description:
Current airborne military communications and electronic warfare systems require ever increasing bandwidths while simultaneously requiring reductions in space, weight and power (SWaP). The replacement of the coaxial cable used in various onboard RF/analog applications with RF/analog fiber optic links will provide increased immunity to electromagnetic interference, reduction in size and weight, and an increase in bandwidth. However it requires the development of high performance, high linearity optoelectronic components that can meet extended temperature range requirements (-40 to 100 degrees Celsius (C)). Additionally, avionic platforms pose stringent requirements on the SWaP consumption of components such as optical transmitters for avionic fiber communications applications. To meet these requirements, new optical component technology will need to be developed. Current analog optical transmitter technology typically consists of discrete lasers and modulators operating at 1550 nanometers (nm), with a requirement for active cooling for operation in avionic environments. To meet avionic requirements, the transmitter should integrate laser and modulator into a compact uncooled package that can maintain performance over full avionic temperature range. It is envisioned that a Gallium Arsenide (GaAs) based transmitter at approximately 1 micrometer wavelength can meet this requirement. One (1) micrometer GaAs optical sources can operate over an extended temperature range (>100 degrees C) at high efficiency (up to ~60%). This is currently not possible at 1550nm. The desired optical component is a GaAs-based integrated analog transmitter (laser and high-efficiency modulator), with an integrated

optical source with low relative intensity noise (RIN) (